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About our CONTRIBUTORS

W. E. WILSON, D.D.S. (St. Louis University School of Dentistry, 1919) is a general practitioner who is one of the pioneers in the field of plastics as applied to dentistry, having been engaged in ten years' research on these new materials. Last June, this magazine published the first preliminary report on THE CASTING OF PLASTIC INLAYS AND CROWNS. THE CASTING OF PLASTIC BRIDGE PONTICS, in this issue, offers another application of this phase of Doctor Wilson's technique. Reports will be made here in the near future of numerous other services in the field of plastics by somewhat different methods which are now being developed by Doctor Wilson.

L. C. HOLTZENDORFF, JR. has his D.D.S. from Atlanta Southern Dental College (1934) and a B.B.A. from Emory University (1928). In May of this year, Doctor Holtzendorff published with us his ingenious method of RECORDING THE NATURAL VERTICAL DIMENSION.

ROBERT NEWTON HARPER received his D.D.S. in 1919 at the Baltimore College of Dental Surgery of the University of Maryland. He is a general practitioner whose interest in pre-extraction records and anterior centric records has led him into the application of such records for identification purposes. In these warring times the subject of identification assumes universal significance and the importance of the teeth in establishing identification will become increasingly evident.

DAVID F. HERON, D.D.S. (University of Southern California, 1919) was a contributor to the old DENTAL DIGEST and has written for other dental as well as medical journals. Doctor Heron who has a general practice was formerly an instructor at Wayne University College of Medicine and is now on the staff of the Alexander Blain Hospital in Detroit. The significance of THE CORRECTION OF ANATOMICAL DEFECTS BY THE USE OF RUBBER is pointed out in The Editor's Page.

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The Casting of Plastic Bridge Pontics

W. E. WILSON, D.D.S., Springfield, Illinois

DIGEST

1. A plastic material is used in place of porcelain for bridge pontics.

2. A specific formula to standardize the plastic has been developed which insures the requirements of occlusal stress, elastic rebound, cold flow, impact, and tensile strength.

3. The technique calls for the casting of the plastic; therefore, a special casting machine has been devised.

4. Shades with adequate translucency for various blends of teeth have been determined.

5. As a practical example for explaining the technique the restoration of the upper first and second bicuspid is described in step-by-step detail.

THE RESPONSE TO MY first article[1] on the casting of plastic inlays and crowns contained numerous inquiries as to the equipment, materials, and technique used. It seems advisable to explain, therefore, that until now I have been considering the subject of plastics as a research problem, and as a dentist at the chair, thinking in terms of serving the patient. The present article and my previous publication were intended as preliminary reports. Arrangements, however, are now being made with a manufacturer, so that the investment, machine, and plastic formula will be available to the dental profession in the near future. It is hoped that a specific standardization can be determined, so that it will fit the requirements of every dental operator.

When dentists attempt to restore lost teeth, they realize that each case presents an individual problem. The restoration must combine physiologic needs, masticatory efficiency, durability, and esthetic qualities.

The usual practice in selecting fixed bridge porcelain pontics has been limited largely to standard shades, molds, shapes, and contours, owing to mass production methods; otherwise the cost would be prohibitive. It is necessary to grind these standard molds to fit each case unless special baked porcelain is used. Because of this, few pontics have occlusal form. Generally, they are flat, lacking functional occlusion in lateral excursion and thereby produce trauma in the abutment teeth.

For several years I have been studying the use of plastic in place of porcelain for various bridge pontics. A special formula has been developed for this use as has been done for the crown and inlay technique, described in the June issue of this magazine. In this formula wear, occlusal stress, elastic rebound, cold flow, impact, and tensile strength have been taken into consideration.

Shades have been developed for the various blends of teeth. The present trend toward translucency used in porcelain can be carried out in plastics because of their clear water color. The manipulation of plastics in this technique is so similar to that of baked porcelain, so familiar to the operator, that the same skill and manipulation of color tone can be exercised.

In bridge pontics two-tone shades are required from the incisal to the gingival. For that reason in this method a monomer-polymer methacrylate is used, which is hand-packed, and then put on the same casting machine as is used in casting plastic crowns and inlays. It is placed under force internally through the sprue-hole to overcome shrinkage and increase condensation in the mold, thereby making a stronger case than is had under the normal packing method.

It is not the purpose here to discuss the bridge abutment as all the standard preparations have been used. Many tests have been made of various replacements of the upper and lower first molars, upper bicuspid, lower

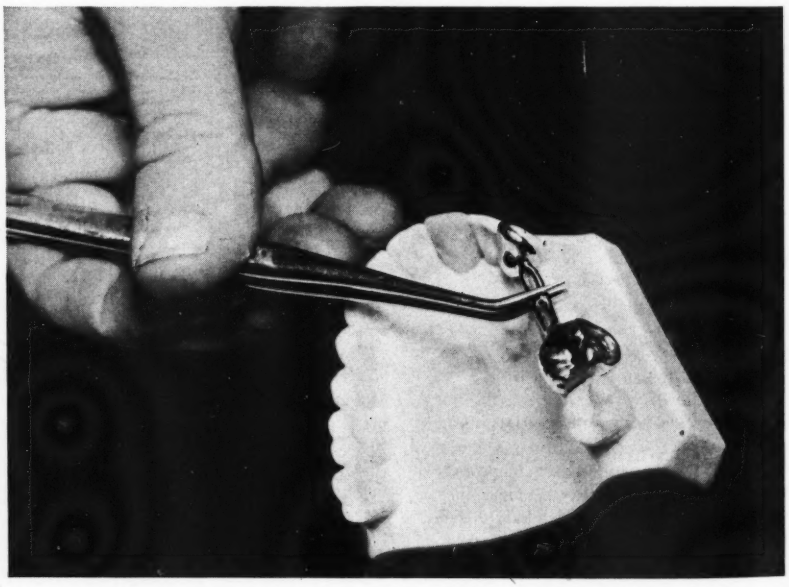


Fig. 1—Checking gold three-quarter crown and gold bar for fit. Upper first bicuspid, second bicuspid and first molar crown veneer are to be constructed of porcelainized plastic.

[1]Wilson, W. E.: The Casting of Plastic Inlays and Crowns, DENTAL DIGEST, 46:202 (June) 1940.

anterior diotoric plastic pontic, and upper Steele's plastic pontic. For a practical example in explaining the entire technique, I have chosen the restoration of the upper first and second bicuspid, which is a common problem both mechanically and esthetically.

Technique

1. A casting frame of gold is attached to the two abutments and used in the same manner as in making special porcelain pontics.

2. The frame is checked in the mouth to make sure that it fits satisfactorily in place over the abutments.

3. The frame is removed and placed on the model, and the pontics are waxed to the proper contour, shape, and size.

4. The frame is then removed from the model and placed into the mouth to check the lateral excursion and bite relationship.

5. The operator now has the opportunity to build the pontic to mandibular functional occlusion in the mouth.

The gold abutments, frame, and carved wax are ready for investment in the flask.

6. *Investment*[2]—The wax pontics are thoroughly cleaned with a solvent to assure a smooth surface. A sprue-former is placed on the lingual side of the wax to make sure that it is secure. One must be cautious in cleaning the bridge and wax pontics after each step to safeguard against flaws in the finished product.

a) The same special investment is used as in the crown and inlay technique. This is mixed with the proper amount of water until it is thick and creamy.

b) Pour the investment into the lower half of the flask of special design until it is level, and insert the sprue into the sprue-hole, covering only the lingual half of the wax pontic and bridge.

c) Let the lower half set until thoroughly hardened.

d) After the investment has hardened, clean the wax and hardened investment, and make any corrections desired.

[2]None of the standard investments, such as die stones, plasters, and silica investments suits the requirements of an investment for this technique. Studies have been made of a new combination of die stone, plaster, and silica. Thus far it is found that a combination in proportion of 50 per cent die stone, 40 per cent refined plaster, and 10 per cent silica answers the purpose for this technique, but the composition requires further study for standardization.

Fig. 2—Bicuspid pontics and veneer waxed, showing sprue for casting.

e) Number .001 tin foil is placed over the whole pontic and bridge abutment with orangewood sticks, ball burnishers and the like to insure correct adaptation.

f) The upper half of the flask is placed in position, and the separator is painted lightly over the surface of hardened investment.

g) Make another mix of investment and pour into the flask. Place the top cover over the flask and allow to set until thoroughly hardened.

h) After setting has been completed, place the flask in hot water for a few minutes and separate. The wax is cleaned by pouring boiling water over it a few times. Then clean thoroughly with chloroform as a solvent.

i) The lingual or sprue side is now tin-foiled with number .005 tin foil and again care must be taken properly to burnish the mold. The tin foil is cut away from the sprue, so that it will not interfere with the plastic in casting through the sprue-hole.

7. *Blend by Monomer - Polymer Method*—As stated before, the mono-

Fig. 3—Investing lingual half in sprue-hole side of flask.

Fig. 4—Packing two-toned plastic in flask, showing shade guide, plastic in bottles, plastic in mixing bowls, and instruments used.

mer-polymer method is used to acquire the two-tone or three-tone blend desired. The polymer formula regulates the various strengths desired, all of which can be varied over a wide range. We have a measured dropper for the liquid and the proper weight of polymer formula, so that the exact proportions of each are used. If, for example, we have a two-tone blend selected from the shade guide, those two shades are picked from the polymer powder bottles of those numbers. This will assure the exact shade as in selecting shades of silicate. The polymer formula also regulates the shading. Each of these shades is mixed with the proper proportion of monomer liquid in separate mixing bowls. When the monomer liquid comes into contact with the polymer powder the monomer will gradually begin to turn over to the polymer. This is slow at first, and will hasten at high temperatures. This explains how finally, on curing by the proper heat, one solid mass of plastic is had.

A lid is placed over the mix and the mix is allowed to set until it becomes a thick doughy mass in preparation for packing.

8. *Packing*—Packing is done at room temperature, so that the monomer will not turn over to the polymer too rapidly, thus hardening before the final pack is completed.

a) Lubricate the tin foil on both halves with cocoa butter, removing the excess with cotton.

b) Be sure that the wax beads to guide the placing of the various blends are discernible through the tin foil.

c) Place the incisal color plastic to the bead following whatever contours are shown and desired. This is done in both halves of the flask.

d) Place the next shade down to the gingival, making sure that it is packed well to the brim with no excess.

e) Drop one drop of monomer liquid on each half of packed plastic.

f) Place the flask together and press in a hand-press until it is closed.

g) Open the flask and remove all excess fins of plastic, leaving only the plastic pontic.

h) Check the shades at the bead lines. Any corrections desired can be made at this time.

i) Remove the sprue from the sprue-hole carefully. Make sure the hole is clean.

j) Place the excess plastic into the heating chamber of the casting machine and clamp the flask over it with the sprue-hole down, so that when casting the plastic will enter into the mold, creating internal pressure. This is an important factor as there is considerable shrinkage when the monomer is turning over to make a hard polymerized mass. This also adds strength to the finished pontic.

k) Turn on the heat of the casting machine and set the time clock for about 45 minutes. The heating element will heat the flask gradually, creating a controlled steam heat in the investment with the proper pressure.

l) Remove the flask and let cool at room temperature.

m) Remove the bridge from the investment.

9. *Polishing and Finishing*—a) The plastics are polished with fine sandpaper discs and stones, cocoa butter being used as a lubricant.

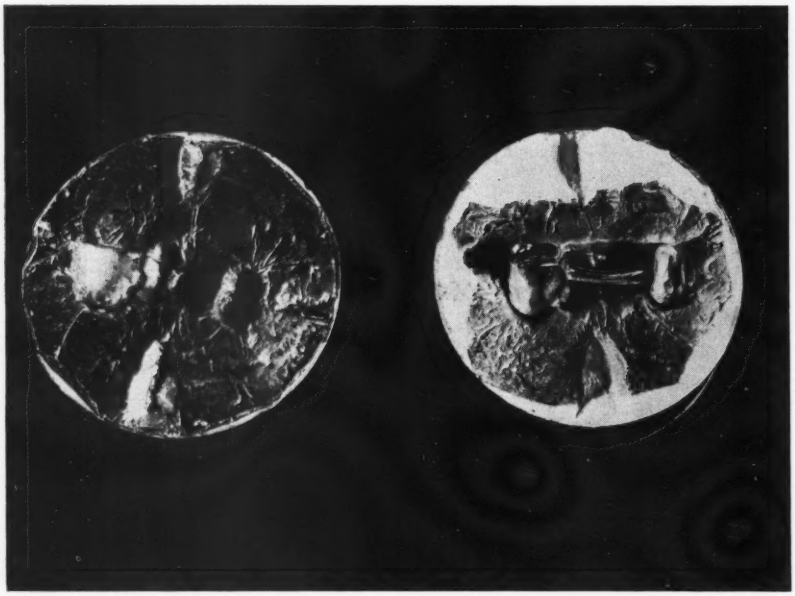


Fig. 5—Upper and lower flasks invested and tin-foiled, showing sprue-hole made by removing sprue in lingual half and three-quarter crown and bar in labial.

b) The bridge is then placed in the mouth and spot-ground to proper occlusion.

c) The pontic is polished with fine pumice on felt wheels and wet prepared chalk. Any desired finish can be obtained from a dull to a high luster.

d) The bridge is ready for the setting, which is done in the same manner as used in other bridgework.

Advantages of Plastic Pontics

1. The ideal in esthetics can be accomplished.
2. The color will be retained indefinitely.
3. The specific gravity is low, affording a lighter bridge.
4. Plastic pontics are highly resistant to acids, alkalies, oils, and alcohols.
5. The mouth tissue tolerance is excellent.
6. Plastic pontics are easy to finish and polish.
7. They are stronger than porcelain.
8. Contours, shapes, and sizes to suit each individual case can be had as desired.
9. The time for construction is considerably less than for the same type of restoration in porcelain.
10. Individuality can be expressed in each case.
11. Pink plastic tips and saddles may be used to prevent the appearance of gum recession.
12. Close bites can be solved with a good strong pontic.

Comment

With the development of technology and chemistry, dentistry may be expected to enlarge its scope in the use of new materials. We have witnessed the rapid change in denture materials, new metals for partial construction and the use of porcelain. This change is now accepted in every day practice. The fixed bridge has lagged behind with the use of essentially the same old methods, techniques, and materials. It seems certain to me that the whole field of operative dentistry and its divisions of restoration will present new methods with the use of plastics. The experiments conducted thus far have been done with the thought in mind, not of discarding present methods, but rather of seeking new and better and more efficient answers to problems presented to us.

Myers Building.

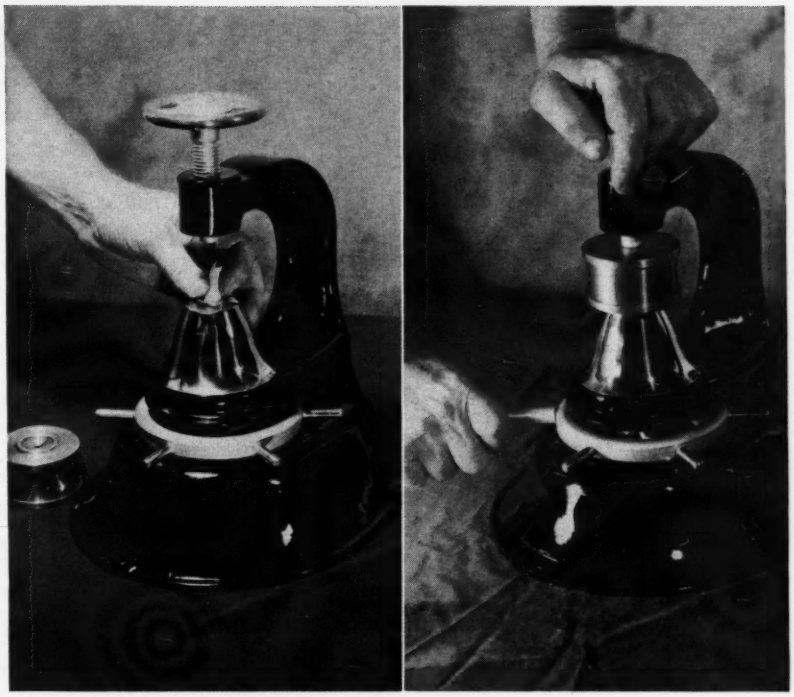


Fig. 6 (left)—Placing plastic in heating chamber preparatory to casting.
Fig. 7 (right)—Casting plastic.

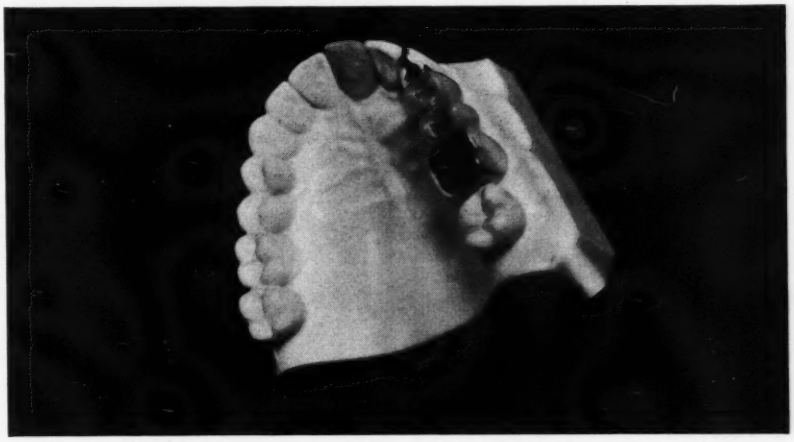


Fig. 8—Finished bridge on model showing two bicuspid pontics and veneer on first molar crown.

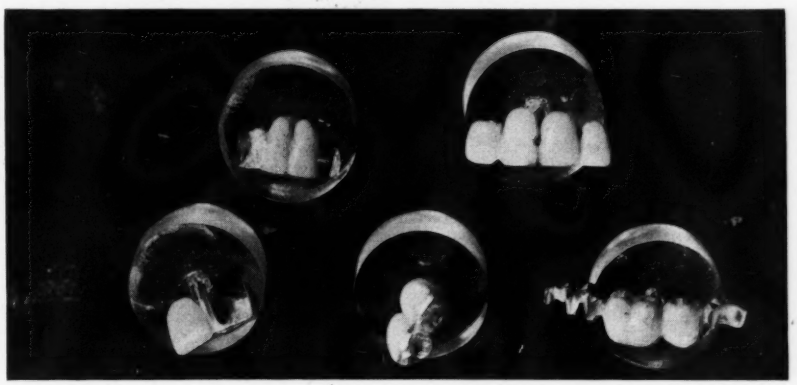


Fig. 9—Various types of bridges.

The Functional Bite

L. C. HOLTZENDORFF, JR., D.D.S., Valdosta, Georgia

DIGEST

1. Taking the bite or recording the correct interarch relationship and transferring that relationship to an articulator are considered as primary in denture construction.

2. Taking the bite entails the following:

a) establishment of the correct vertical dimension;

b) obtaining the correct centric relation of the patient's jaws;

c) obtaining the correct functional relations of the patient's jaws;

d) recording the position of the axis of the right and left condyle in relation to the upper jaw, in centric or retruded position.

3. An accurate technique aims at functional as well as esthetic harmony. To that end the following are necessary:

a) recording of the centric and lateral positions of the patient's jaws;

b) a facebow record;

c) the use of an articulator that is adjustable to these records.

4. Equipment: A monel metal tracing device; a lower monel metal impression and bearing table; a facebow designed with a fork on its attachment end.

5. The author believes his step-by-step technique streamlines the taking of the bite so that the general practitioner may employ the technique readily.

6. The advantages and disadvantage of the technique are outlined.

IN FULL DENTURE construction, taking the bite or recording the correct interarch relationship and transferring that relationship to a mechanical articulator are important steps.

The various methods of carrying out this chair and laboratory procedure may be roughly divided into three groups:

1. The first method assumes that the mandible works only on a hinge axis; that is, without any lateral motion whatever.

2. The second group makes allow-

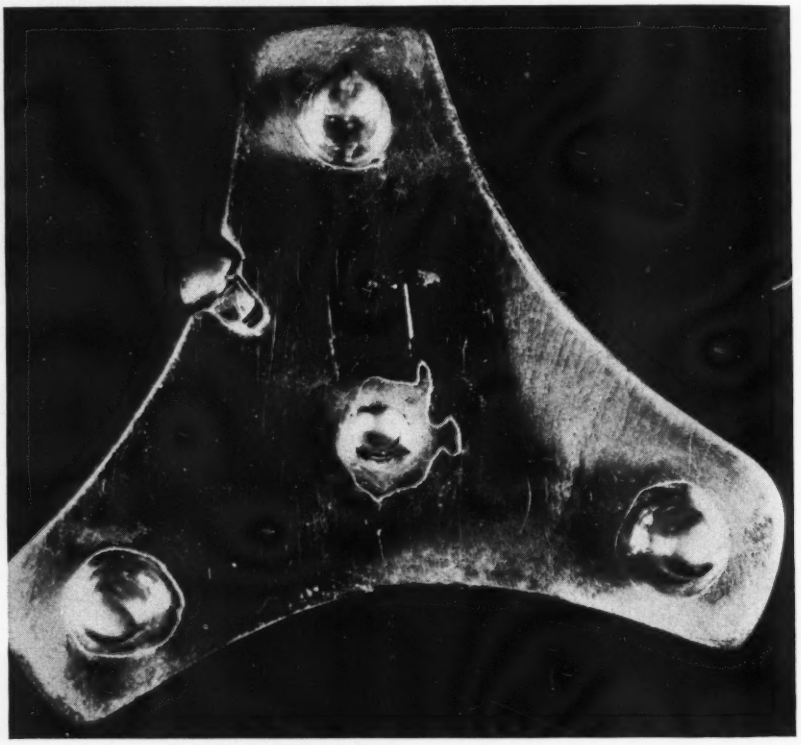


Fig. 1—Upper device (bottom).

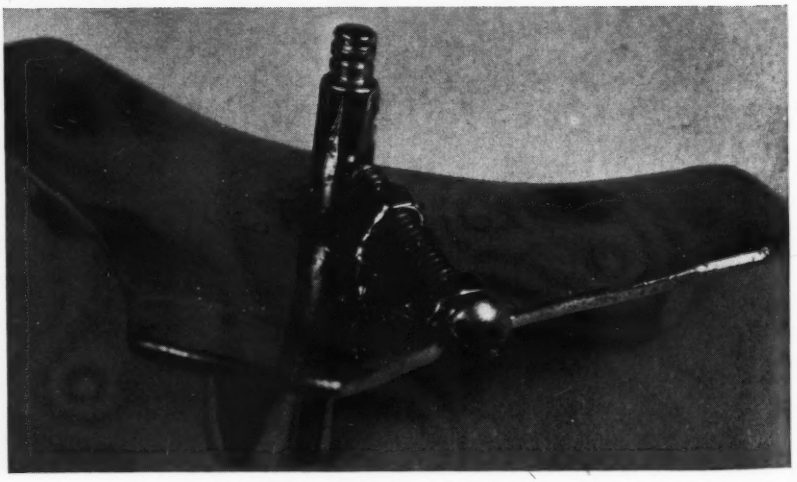


Fig. 2—Upper device (top, showing set screw).

ance for the lateral and protrusive movements of the jaws by using articulators or devices set to reproduce only average jaw movements. This type of denture is constructed (a) on articulators having average fixed condylar inclinations; (b) on articulators having adjustable condylar inclinations which, however, are never adjusted; or (c) on a curved template (usually designed after Monson's eight-inch circle theory). The only record taken from the patient is that of centric occlusion, which is still often taken with a handful of beeswax.

3. The final and most accurate method is that technique which aims at recording the individual movements and relations of each patient's jaws and reproducing that movement and relation on an adjustable articulator, so that the finished dentures will be in harmony functionally as well as in appearance. This procedure requires a recording of the centric and lateral positions of the patient's jaws and a facebow record in addition to the use of an articulator which can be adjusted to these records.

The general practitioner has been reluctant to undertake the use of the third technique despite its obvious superiority. His objections have been that it requires the expenditure of too much time and is unnecessarily complicated.

It is the purpose of this article to describe a method of taking the bite which is not highly complicated nor unduly long.

The taking of the bite consists of the following essential requisites: (1) establishment of the correct vertical dimension; (2) obtaining the correct centric relation of the patient's jaws; (3) obtaining the correct functional relations of the patient's jaws; (4) recording the position of the axis of the right and left condyle in relation to the upper jaw. This is obtained in centric or retruded position.

Equipment

The equipment needed includes the following:

1. A triangular-shaped upper monel metal tracing device which has in its center a small vertical tube through which slides a 3/32 round brass bearing pin (Figs. 1 and 2). The brass pin can be locked into any position by means of a set screw (Fig. 2).

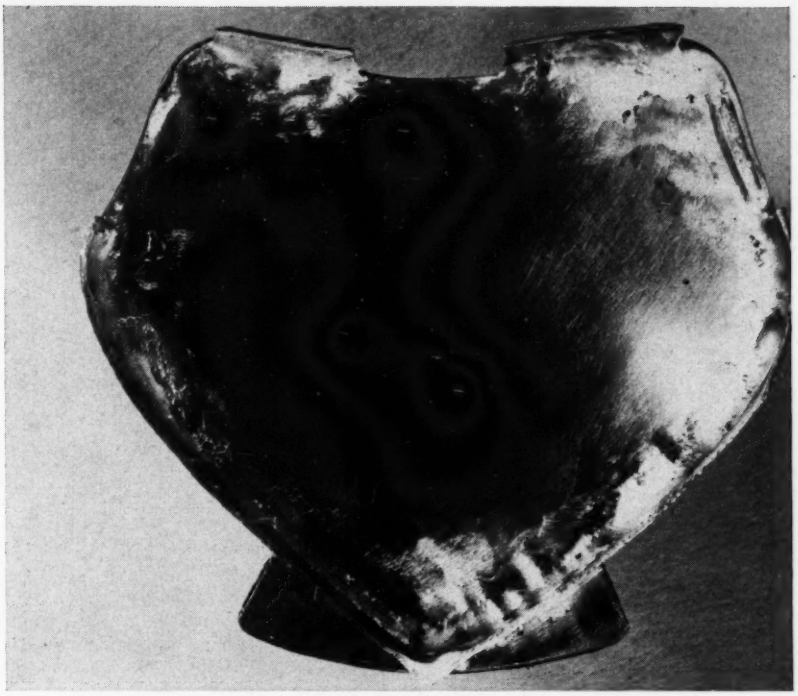


Fig. 3—Lower table.

On the bottom of each of the three wings there is soldered a small blunt monel metal tracing stud. The tracing studs have been rounded and highly polished.

2. A lower monel metal impression and bearing table constructed so as to cover the ridges and all the space between (Fig. 3). The sides are partly lined with a low rim to help retain the compound used in the technique. The anterior part of the plate metal is extended to form a convenient handle.

Both upper and lower devices are built on a curve, the upper convex downward and the lower concave upward. This is done to utilize all the available space between the upper and lower jaws during functional movement.

3. The facebow, designed with a fork on its anterior or attachment end. This fork fits around the upper device when attached to the upper baseplate. The posterior or condylar ends are adjustable in all directions (Figs. 4 and 5).

Wherever possible monel metal is used in constructing these devices. It does not tarnish and maintains its temper after hard soldering. The lat-

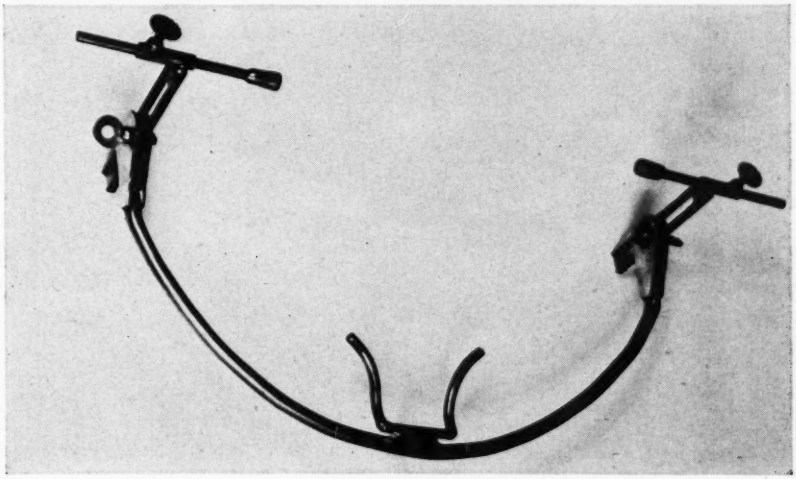


Fig. 4—Facebow.

Fig. 5—Upper baseplate, facebow fork, and impression of fork on baseplate.

Fig. 6—Lower table fixed to lower baseplate (mirror shot).

ter property brass does not possess.

Technique

It is assumed that impressions have already been made and stone casts poured; that preextraction records, such as the impression of the anterior teeth, shade of the natural teeth, and profile template[1] have already been made.

Preliminary Laboratory Procedures—1. Heavy base-plate material is adapted over the upper and lower casts and trimmed for muscle clearance. Heavy baseplate is approximately .097 of an inch thick as contrasted to ordinary baseplate which is only .050 of an inch thick. Its strength and rigidity reduce distortion to a minimum.

2. The upper device is heated and fixed to the upper baseplate by pressing it into the base-plate material. It should be fixed to the baseplate as in Fig. 5 with the central bearing pin approximately in the center of the upper arch. The labial and buccal side and part of the ridge of the upper baseplate are oiled.

3. The fork of the facebow is heated and pressed into the baseplate on each side and in front of the upper device.

4. After cooling the fork is detached from the baseplate, a well defined impression being left in three places.

The oil prevents the facebow fork from adhering to the baseplate (Fig. 5).

5. The lower impression and bearing table are affixed to the lower baseplate with heat (Fig. 6).

6. It is desirable but not essential that the upper and lower devices be parallel to each other when placed in the mouth. It is usually found best to delay placing the lower device on the baseplate until the patient has been seated and an examination of the relation of the two ridges made. The examination will help in accurately setting the lower device so that it is parallel to the upper.

Chair Technique—1. The upper baseplate is placed in the patient's mouth.

2. The horizontal rods of the condylar ends of the facebow are moved to their distal limits.

3. The facebow is arranged around the patient's face and the anterior fork is fitted into its impression in

[1]Holtzendorff, L. C., Jr.: Recording the Natural Vertical Dimension, DENTAL DIGEST, 46:165 (May) 1940. Note Figs. 25 and 26.

the upper baseplate. The patient is asked to hold it in place by pressing up on each side of the fork with both thumbs (Fig. 7).

4. The condylar ends of the facebow are adjusted and locked in place, so that the ends of the horizontal rods are in light contact with the skin over the axis of the patient's mandibular condyles. In centric occlusion this position has been found to be 13 mm. (one-half inch) anterior to the orifice of the ear on a line drawn from the upper margin of the orifice of the ear to the ala of the nose (Fig. 8).

5. The facebow is removed intact and laid aside for future reference.

6. The upper central bearing pin is drawn down to its fullest extent and locked in place by the use of a small screwdriver on the set screw.

7. The lower baseplate and metal table are inserted and the patient is asked to close until the upper bearing pin touches the lower table. The set screw is released slightly with the screwdriver and the patient is instructed to exert light pressure between the jaws. The pressure causes the jaws to move together. Under the operator's direction, this movement is stopped at the correct vertical dimension and the upper bearing pin is locked rigidly in that position. The correct vertical dimension is determined when the profile template exactly fits the skin of the nose and chin (Fig. 9).

8. The patient is then instructed to open the mouth. A china marking pencil (a pencil with a grease base instead of carbon) is used to blacken the lower table in an area directly under the bearing pin. The patient is asked to close and move the lower jaw to the right and left and forward and backward without taking the upper and lower out of contact.

9. The lower is removed and the interarch tracing examined (Fig. 10).

10. A roll of warm compound is adapted to the lower table in a U-shape, so that it will lie under the tracing studs but not over the tracing made by the central bearing pin.

11. After the compound is allowed to harden, the top surface is flamed and the lower is reinserted in the mouth. The patient is instructed to go through the same motions as already described. The lower jaw movement causes the upper tracing studs to carve a distinct impression in the compound below each stud (Fig. 11).

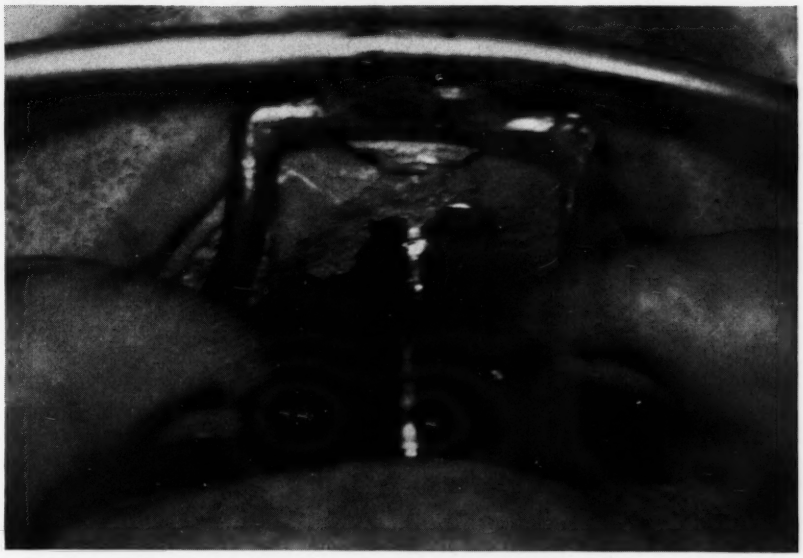


Fig. 7—Patient's thumbs holding facebow fork into its impression in upper baseplate.

Fig. 8—Posterior end of facebow adjusted to patient's face.

12. The lower is removed from the mouth and chilled. A knife is used to trim away one-eighth inch of compound on the sides and floor of the three impressions.

13. The upper baseplate is removed from the mouth, dried, and light machine oil is wiped over and around each tracing stud. It is then reinserted in the mouth. The machine oil prevents plaster from sticking to the tracing studs during the next step.

14. A small mix is made of impression plaster containing an accelerator. Some of this mix is placed in each of the three impressions in the lower compound and the lower is inserted in the mouth. The patient is instructed to close and make the same lateral and protrusive movements as previously described. The patient should be warned not to break contact between the jaws until the plaster has made its initial set.

15. After the plaster has set, the upper and lower are removed from the mouth separately and checked in all positions (Fig. 12).

It will be seen that the upper tracing studs have formed a triangular pattern in the plaster of the lower impressions. These plaster impressions provide a fixed record of the centric, lateral, and protrusive relations of the upper and lower jaws.

Fig. 9—Profile fitted to face to obtain correct vertical dimension.

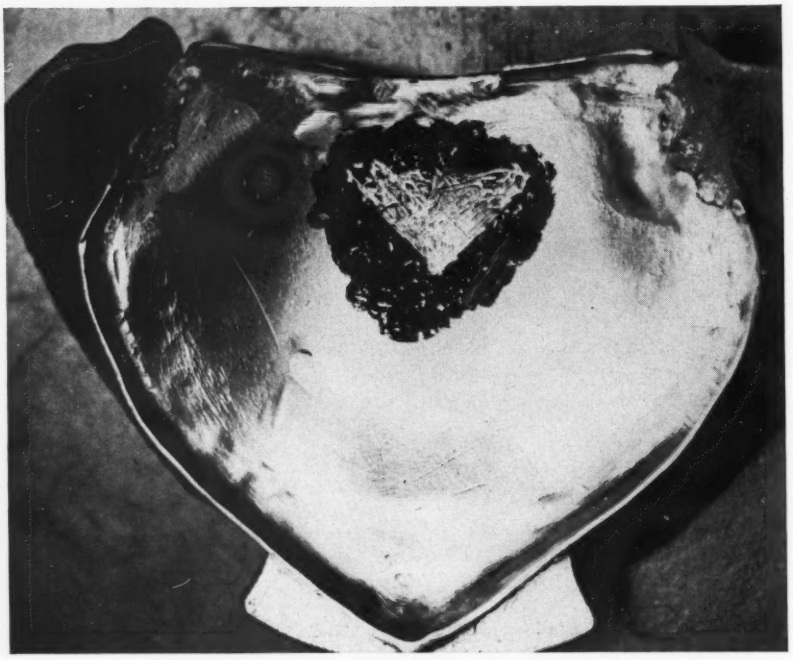


Fig. 10—Interarch tracing on lower table.

Fig. 11—Impressions of upper tracing studs in lower compound.

If the upper baseplate and device are placed in the impressions of the lower, the whole can be made to move in the same positions and relations extra-orally as it functioned in ra-orally.

Transferring the Records—1. Any loose plaster on the upper device or in the lower impressions is removed. The horizontal rods of the facebow are moved mesially or distally (an equal amount on the two sides) until they fit over the ends of the articulator. The horizontal rods of the facebow are notched to facilitate this adjustment. The facebow is waxed into its impressions on the upper baseplate.

2. The upper and lower casts and baseplates are fitted together in centric position and a heavy rubber band is slipped over both casts to hold them together. It is not necessary to wax the baseplates to the casts as they are held securely in place by pressure of the rubber bands.

3. Another rubber band is slipped over the casts, so that it catches around the front handle of the lower table and is then carried back to and over the top and back of the upper cast. This band pushes the upper cast forward and the lower cast backward, automatically holding the entire set-up in centric position (Fig. 13).

4. The facebow is locked to the condyles of the articulator.

5. A small pyramid of modeling clay is placed under the lower cast to support the entire set-up in its proper occlusal-plane-level position (Fig. 14). Plaster of Paris is introduced to seal the casts in the articulator.

Adjusting the Articulator—1. After the plaster has hardened the rubber bands are cut and the facebow is removed.

2. The articulator is then adjusted for function as follows:

a) The incisal guide pin of the articulator is raised and the condylar guidance slots are loosened.

b) The lower cast is thrown in the lateral position. This will bring the condyle of the opposite side forward.

c) The two casts are held together with one hand while the other hand is used to adjust the condyle guidance slot until a position is found where the tracing studs of the upper are all in contact in their lower impressions. This gives us the correct condylar inclination on that side.

d) The condyle guidance slot is locked.

e) The opposite side is adjusted in the same manner.

f) The incisal guidance pin is brought down into contact again and locked.

An alternative method of finding the individual condylar inclination is by using the protrusive position and adjusting the two sides simultaneously. Either method described can be checked against the other for accuracy. Any other minor adjustments of the articulator may be made from the information derived from the interarch tracing and the facebow record.

The articulator having been adjusted to reproduce the individual movements and relations of the patient's jaws, the teeth may now be set up in balanced occlusion.

Advantages

1. Centric occlusion is accurate and automatic.
2. Both lateral and protrusive relations are easily obtained and transferred to the articulator.
3. Centric and eccentric relations are obtained in one operation.
4. Correct vertical dimension is found without removing either the upper or lower from the mouth.
5. The facebow does not need to be waxed to the baseplate while recording is done for it bears a fixed, removable relation to the baseplate, thereby reducing the time spent at the chair.
6. After centric and eccentric positions are recorded in the mouth, the upper and lower may be removed from the mouth separately which minimizes distortion.
7. The entire set-up and facebow record can be adjusted to the articulator with one mix of plaster.
8. The amount of time spent (chair and laboratory) has been reduced to a minimum; however, accuracy is not forfeited for economy of time.

Disadvantage

The outstanding disadvantage of the technique is the absence of wax bite rims upon which the high and low lip line, median line, and occlusal plane lines may be marked.

It is my opinion that this information may be as accurately obtained, however, from preextraction records and from the try-in which should be the step following that of taking the bite.

Strickland Building.

Fig. 12—Final plaster impressions of upper tracing studs. This is an impression of centric, right and left lateral and protrusive positions.

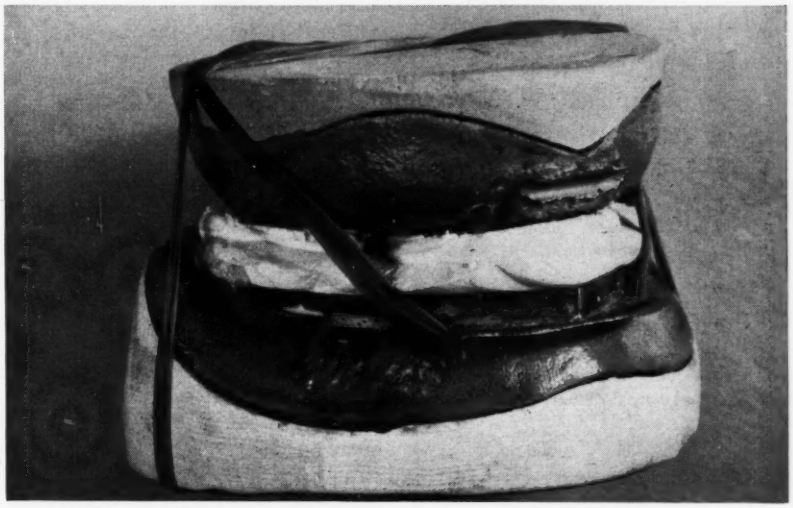


Fig. 13—Casts and baseplates held together in centric position by rubber bands. Photo graph taken without facebow so as to show adjustment of rubber bands.

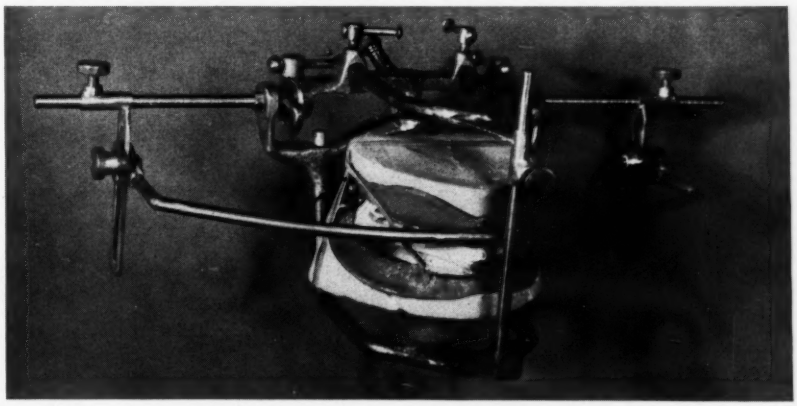


Fig. 14—Entire set-up ready for plaster mix.

Fig. 15—A set of practical cases. Note variations.

The Use of Anterior Centric Relation Records for Identification

ROBERT N. HARPER, D.D.S., Danville, Virginia

DIGEST

1. Owing to their resistance to destruction, the value of teeth as a means of establishing identity has been recognized.

2. The centric relationship of the anterior teeth varies for each person; thus, it is individual and distinctive and provides a characteristic mark.

3. It is suggested that models of the mouth showing the anterior centric relation be made and kept whenever this is feasible, but in every case the photograph of the model may easily be pasted on a standardized dental chart and filed as a permanent record for identification purposes and as preextraction records.

THOSE SEEKING TO establish identity have for many years recognized the value of the teeth as a means of identification. In many cases, owing to their resistance to destruction by water and fire, the teeth are the only means of identification.

The dental profession is repeatedly called on to help establish identity. Dentists should be prepared to answer these calls in an efficient manner. A dental chart for identification purposes can be helpful but it is necessarily limited.

An important feature, of which a record should be kept, is the difference that exists among people between the upper and lower anterior teeth in centric relation. This variation is individual; hence, distinctive for each person. Not enough attention has been given to this difference, although dentists do recognize the difference that exists between the upper and also the lower teeth of persons, and this difference is rightly termed characteristic.

The anterior centric relation should be included in dental records so as to make identification by the teeth even more positive. If it were possible to find persons with upper and lower anteriors so similar that they could not be differentiated, the anteriors would nevertheless be dependable for positive identification in that the centric relation would be distinctive.

Inasmuch as models in any great quantity would constitute a filing or storage problem, it is suggested that photographs be taken of such models showing the centric relation. The models themselves should be kept whenever this is feasible, but in every case the photograph of the model should be filed with a standardized chart of the mouth. A space on which to paste the photograph of the model should be provided on such a chart.

Record models for identification purposes are invaluable when the occasions arise, but fortunately, the occasions are rare. These record models, however, provide a useful routine purpose in dentistry as preextraction records[1]. Their routine use would mean that they would always be available for emergency identification.

I fully agree with Edward J. Ryan[2] in his plea for a standardized method of identification by the teeth when he says, "The problem of dental identification is one that should be developed by the dental profession; but the impetus for cooperation between law enforcement agencies and the dental profession should come from public agencies."

Summary

The teeth are an accepted means of identification, but the present unstandardized and miscellaneous systems of recording limit their value. In order that the dental profession

[1]Harper, R. N.: A Satisfactory Method of Filing Impressions of the Anterior Teeth for Records, J. A. D. A. 26:1676 (October) 1939.
[2]Ryan, E. J.: Identification Through Dental Records, Am. J. Police Science, Incorporated in J. Criminal Law & Criminology 28:253 (July-August) 1937.

Fig. 1—As there was no tray available that could be used to obtain impressions in all types of occlusions of the surfaces required for these records, it was necessary that one be devised. My adjustable anterior tray is shown here.

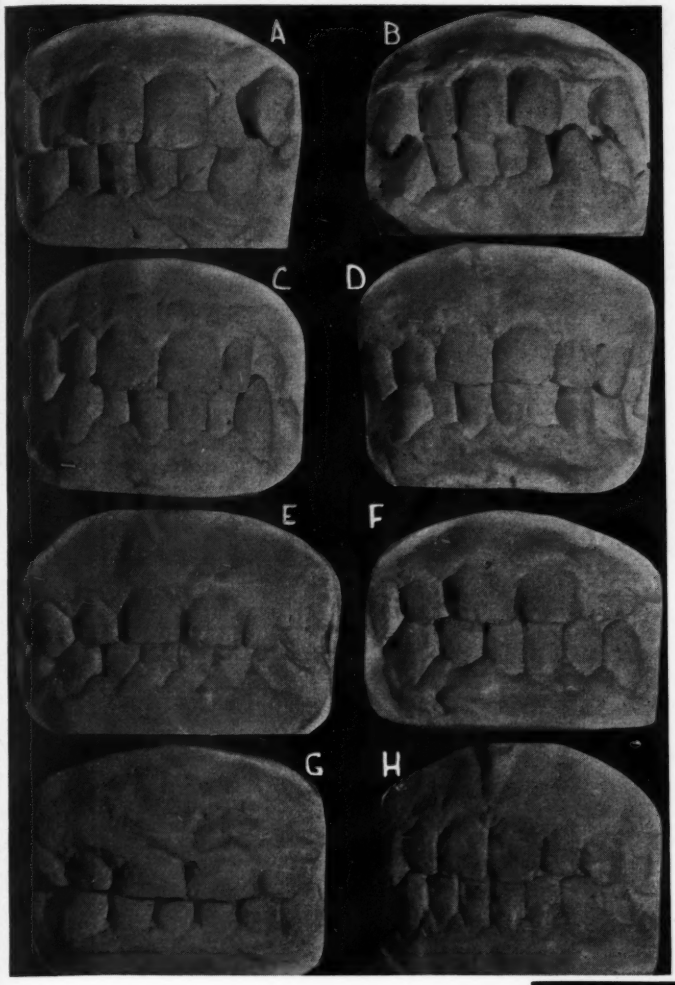


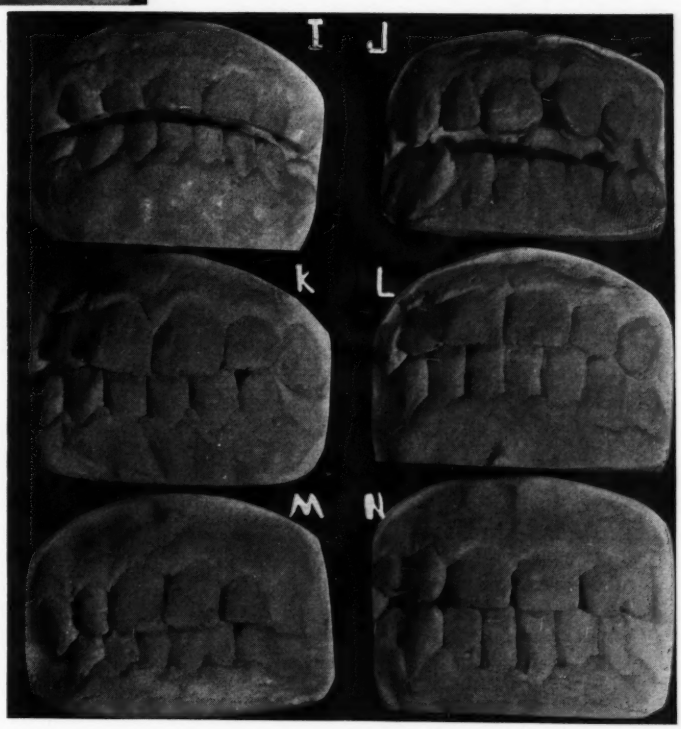
Fig. 2 —Seven pairs of record models, lettered A through N, represent anterior teeth in centric relation of inmates of the city jail. The models have been grouped in pairs according to their similarity.

A and B both show teeth that lap. Note characteristic and amount of the lap; both have palatal displacement of the left lateral, but note difference between A and B as to occlusion of this lateral with lower cuspid; pyorrhea is also present and amount of destruction may be noted.

Pair C and D are also similar but even if the form, size, and arrangement of the individual tooth were identical, it would still be easy to distinguish one from the other because of two characteristics in centric occlusion: the lower left cuspid in C is in protrusion, whereas in D, it is in normal occlusion.The center line is continuous in D, but not so in C.

The two men represented in pair E and F each had thirty-two teeth. No cavities or restorations were present. There was nothing to chart. It could only have been stated that there is a space between the two centrals, but this is a rather common condition and is not dependable information. Dependable information to establish identity is found in the relationship of the lower centrals to this space. In E, the corner of the lower left central shows between the space, whereas in F, the corner of the right central shows.

Distinctive characteristics can also be found in the other pairs to differentiate one from the other.



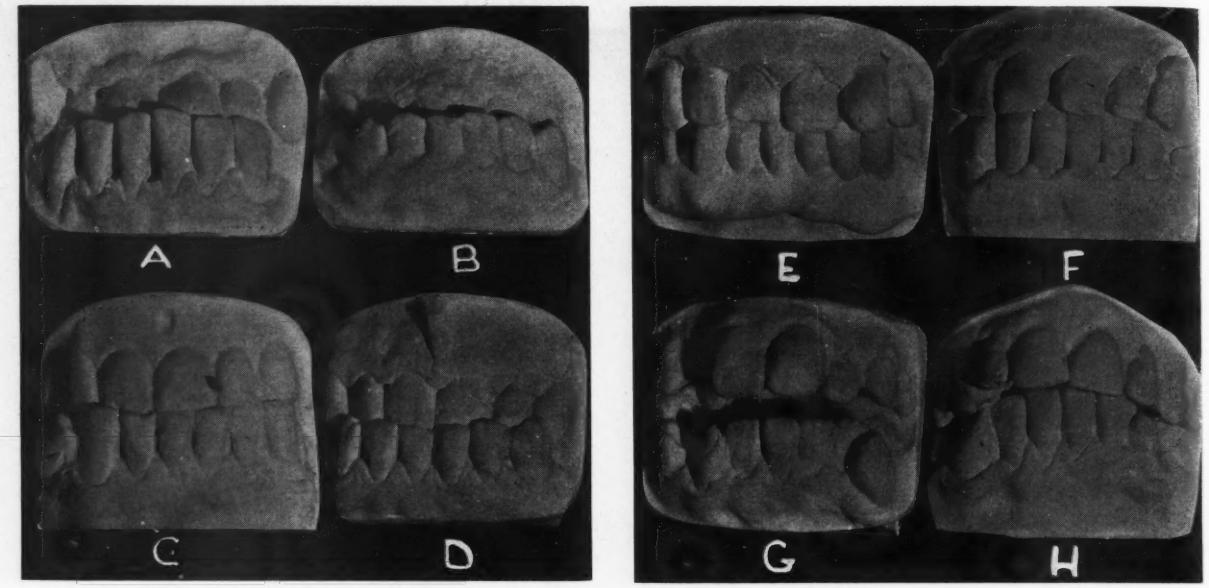


Fig. 3—Four main types of occlusion illustrating the value of recording centric relation. Each pair shows two different degrees of the type represented. There are thousands of variations that could be recorded of each of these types; every record would be distinctive. These models are selected from the file of the author's practice.

may give more valuable assistance to those seeking identification, I have presented the idea of using the characteristic centric occlusion of the anteriors, registered on a single model, of such a small size that they may be filed. As an alternative to filing the models, which might present difficulties, it was suggested that a standardized record chart provide a space on which may be pasted a photograph of the model showing centric occlusion. Photographs of record models are more effective than word description.

These complete records are invaluable as preextraction records and would be a worthy addition to any established system of identification for criminal or civil purposes.

624 *Masonic Temple.*

Summary Abstract from the Literature

Neurotic Symptoms and Changes of Blood Pressure and Pulse Following the Injection of Epinephrine

[Kraines, S. H. and Sherman, Irene C.: The Journal of the American Medical Association, **114**:843 (March 9) 1940.]

The purpose of the study was (1) to observe the effect of epinephrine on the blood pressure and pulse rate of psychoneurotic and normal persons and (2) to compare the sensations following the injection with the patients' recorded clinical symptoms:

"1. The systolic blood pressure and pulse reactions of both psychoneurotic and normal persons are significantly greater following the intravenous injection of epinephrine than of salt solution. A similar difference in diastolic blood pressure was not observed.

"2. The difference in blood pressure and pulse reactions between normal and psychoneurotic persons following intravenous injection of epinephrine are not statistically reliable.

"3. The diastolic blood pressure tends to fall as often as it rises after the intravenous injection of epinephrine.

"4. Epinephrine administered intravenously in dosage sufficient to produce changes in blood pressure and pulse rate produces similar signs and symptoms in normal and in psychoneurotic persons. These symptoms are similar to those commonly described by psychoneurotic patients.

"5. Epinephrine aggravates existing psychoneurotic symptoms and may activate given latent symptoms.

"6. From the therapeutic point of view, a patient will accept the fact that his symptoms are organic and not imaginary, although their basis may be psychologic."

The Editor's Page

THE IMMEDIACY OF falling bombs and bursting shell fire may make us lose sight of the resulting mutilated bodies which must be repaired on some tomorrow. Modern warfare mangles the faces not only of combatants but of women and children as well. Spreading over the decades ahead will be the need to restore thousands of people who are now being butchered. In this reclamation the dentist will play an increasingly important part. Many of the injured will be beyond the hope of plastic surgery and to be rehabilitated at all, they will require the prosthetic skills of dentists. With the newer form of prevulcanized rubber, latex, which changes from the liquid to the solid state upon dehydration, the dentist has a remarkable opportunity to recreate, to repair facial mutilations.

Speaking before the American Dental Association, Doctor Arthur H. Bulbulian, Director of the Mayo Clinic Foundation Museum of Hygiene and Medicine, expressed this point of view:

"It is not surprising . . . to find that the dentist because of his familiarity with the anatomy of the mouth and face and because of his wide experience with the technique of manipulating various dental materials . . . is often called upon to do prosthetic work not only in the mouth but on the face as well . . . Generally speaking, the purpose of prosthetic restorations about the face and mouth may be esthetic or may be functional, as in the case of an acquired or congenital cleft palate restored by an obturator in order to improve speech, or may be both esthetic and functional, as it is in a case of restoration of an entire nose and upper lip improving the patient's appearance and enabling him in his speech." Prosthetic repair is the method of choice over surgical repair, according to Doctor Bulbulian, under the following conditions:

1) when the patient is advanced in age;

2) when the patient needs an immediate restoration in order to carry on his or her work after the removal of malignant disease before reconstruction by surgical means is possible;

3) when the patient is financially unable to pay for hospitalization and plastic surgery;

4) when a plastic operation is considered inadvisable because of the location or the extent of the defect.

In every community there are persons who need prosthetic correction of palatal clefts. This is an opportunity for the dentist to be of wider service. In every community there are those who have suffered the loss of facial parts through accident or disease. This offers another opportunity for the dentist to be of service. Whatever we can legitimately do outside the actual field of dental practice to increase our usefulness gains us recognition as a profession with our medical confrères and with the public and should certainly be gratifying to us.

In this issue is an article describing a simple technique for prosthetic restoration. This article was prepared by a dentist working on a hospital staff. It takes no elastic imagination to see that this dentist, because of his contribution to treatment entirely outside the field of dental therapy, has made himself a more acceptable and valued member of his hospital staff. Such opportunities of service are open to dentists in every community in the United States.

Correction of Anatomic Defects by the Use of Liquid Rubber*

DAVID F. HERON, D.D.S., Detroit

DIGEST

A liquid rubber is used in the restoration of anatomic deformities when time and money preclude the employment of plastic surgery. The step-by-step procedure is described.

THE DISTINCTIVE RESULTS that follow our fast mode of travel and living have created an increasing problem for those interested in plastic and reconstructive surgery. Advances have been made in this field within the last few years but there still are cases, owing to financial difficulties, malignancies, or the element of time, in which immediate artificial restoration is indicated and in which it is not feasible to wait for the delayed results of plastic operations.

Ottofy[1] published the results of a case as early as 1905. His work was carried on in vulcanite, and paint was resorted to in an attempt to make the vulcanite restoration match the skin.

Later a formula using gelatin and glycerin was developed by Zinsser.[2] At about the same time, however, the same ingredients were used in formulas by several other investigators. Bercowitsch[3] and Lederer[4] in 1928 reported good results by the employment of these two materials.

Kazanjian[5] has reported the use of electroplated copper in this type of restoration. Many cases of reconstruction have been done by this method for French soldiers during and after the World War. Batson[6] reported a series of restorative cases in which he used a mixture of gelatin and glycerin.

In the fall of 1936 Bulbulian,[7] Director of the Museum of Hygiene and Medicine of the Mayo Clinic, performed the first experiments with liquid rubber, commonly called latex, and published several articles on this subject during 1939.

As early as 1921 we began to experiment with restorations in vulcanite and in recent years employed plastics in most of these cases. During the last year latex has been the medium employed by us with such excellent results that we feel this is the material of choice. Our main difficulty has been the matching and coloring. Bulbulian[8] experienced this same difficulty. We have tried tints, paints, dyes, water colors and oil in an endeavor to improve the coloring but our best results were obtained with dyes. We feel sure that this problem will be partly solved in the manufacturing process, as the field for the use of this material is extended.

Latex is a prevulcanized rubber and reaches a solid state through dehydration. It is the milky exudate obtained from the rubber tree. When treated with a coagulant it becomes a soft gummy mass. Liquid rubber is derived from this mass and it is this liquid rubber compound which we use in prosthetic restoration.

Liquid rubber applications solidify on drying. In case of repeated applications, drying between coats is suggested as the drying time increases rapidly with the thickness of the application.

Because of his training in model work, and the materials he has at hand, the dentist is best equipped to handle this type of reconstruction.

Technique

1. An impression is taken in an elastic impression material which is

Fig. 1—Cast ready for carving and adjusting of wax nose.

*From the Department of Oral Surgery, Alexander Blain Hospital, Detroit.

[1]Ottofy, Louis: Artificial Nose, D. Cosmos, 47:558-560 (May) 1905.

[2]Zinsser, Ein Einfacher Nasenerzatz, Munchen, med. Wchnschr. 60:2734 (December) 1913.

[3]Bercowitsch, G.: Facial Restorations, D. Cosmos, 70:167-170 (February) 1928.

[4]Lederer, F. L.: Prosthetic Aids in Reconstructive Surgery, Arch. Otolaryng. 8:531-544 (November) 1928.

[5]Kazanjian, V. H.: Treatment of Nasal Deformities with Special Reference to Nasal Prosthesis, J. A. M. A. 84:177-181 (January) 1925.

[6]Batson, O. V.: Use of Gelatin Prosthesis in Facial Restorations, Tr. Am. Acad. Ophth. 1935, pages 317-322.

[7]Bulbulian, A. H.: An Improved Technique for Prosthetic Restoration of Facial Defects by Use of a Latex Compound, Proc. Staff Meet. Mayo Clinic, 14:433-439 (July) 1939.

[8]Bulbulian, A. H.: Personal communication to the author.

2—Wax carving of nose. Ready for investing.

superior to plaster in that it will penetrate more deeply within the undercuts, resulting in a more accurate impression.

2. Care must be exercised that the impression material is not applied while too warm; consequently, the site to be copied should be chilled with cold water and the skin and mucous membrane of the patient prepared with vaseline.

3. The impression is then poured in plaster or stone and a positive likeness of the remaining portion of the selected site, together with the surrounding tissue, appears in the cast (Fig. 1).

4. The missing portion is next carved in wax (Fig. 2).

5. The patient is requested to return, at which time the wax is adjusted and perfected directly on the subject. Ordinary base-plate wax is used for the body of the restoration, but the periphery is perfected and additions are made with softer and less irritating carding wax.

6. The resultant wax pattern is invested in two parts, the technique for which is familiar to every dentist; that is, by filling a small pasteboard box with plaster and partly immersing the prepared wax pattern in it. This is allowed to harden.

7. Soap or any other suitable separating medium is added and the top part poured with plaster. (It is often advisable to notch the first half to aid later in guiding the two parts together).

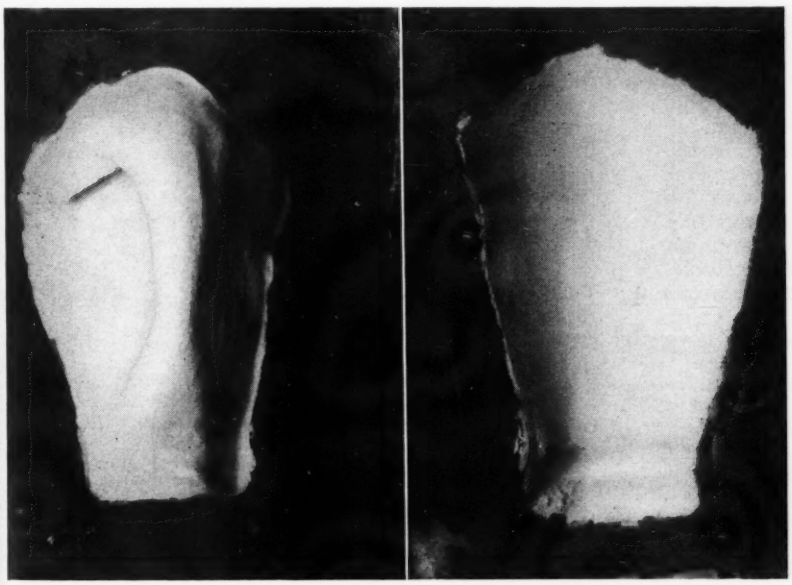


Fig. 3—Male and female parts of cast ready for pouring of prevulcanized rubber.

Fig. 4—A, Prevulcanized rubber ear completed by the same technique employed in restoring nose. B, Prevulcanized rubber finger. Artificial nails may be procured at any drug store.

8. After melting the wax with hot water the two parts are separated (Fig. 3).

9. The liquid rubber is placed in both halves (to prevent bubbles) and the two parts are again folded together.

10. It is then placed in an incubator at 65° F. for forty-eight hours.

In the restoration of the finger (Fig. 4, B) added retention was gained by fitting a gold ring around the stump. (Brass, copper and all copper-containing alloys cannot be successfully used with this material.) In the case of nasal deformities, glasses are used for retention.

In order further to improve the cosmetic effect several of our patients are using a preparation known as Cover Mark, a water-proof make-up foundation. This material comes in several shades and was perfected with the object of concealing large blemishes and birth marks. This cream is applied to the restoration and the surrounding tissue and face powder is then dusted on, to suit the individual necessity.

Comment

The psychologic benefit that these patients have been able to derive from the improved cosmetic effect more than compensates for the expense and effort incurred. The use of liquid rubber furnishes an efficient as well as reasonable financial method of restoring anatomic deformities.

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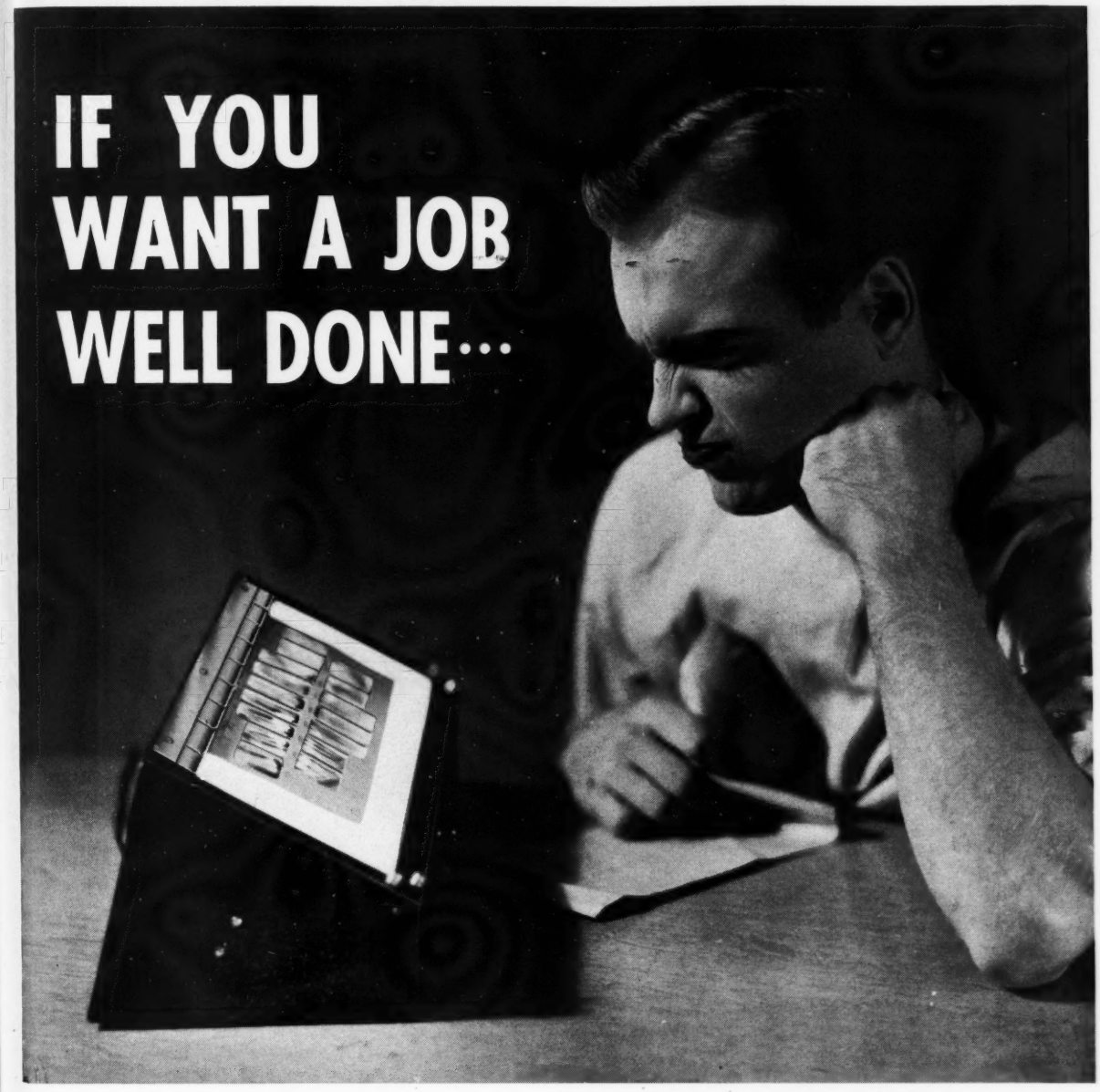

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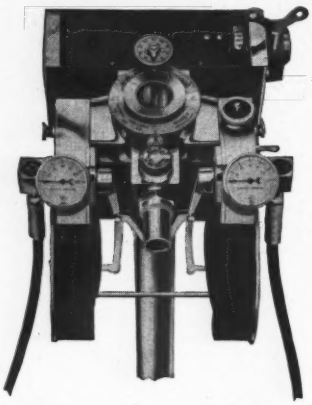

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NOTES ON THE *Cuff*

A Cotton Mather for Clinicians . . .

MY AMERICAN HISTORY is hazy in spots but as I recall, Cotton Mather was the dour-faced fellow of New England who hung people by the thumbs, fastened folks in racks, and generally raised hell with dissenters. He had a special treatment for shrewish women and for the common scold. I don't recall the blood-letting details, but I think he made slight cuttings from the tongues that wagged too much. People who preach too much and scold too often aren't the best company in the world and are looked upon as something slightly less than leprous by their fellows. I nevertheless herein risk the danger of becoming a common scold on a subject that is perhaps none of my affair.

I am indignant over clinicians who promise to give clinics, have their names printed in programs, and then fail to appear for their performances. At the last American Dental Association meeting in Cleveland, about fifteen or twenty of the listed clinicians were not in their assigned places; they were among the missing. It is probably better that some of these people disappointed by their absence than by their presence. Many of them probably would not have anything to offer anyway. No doubt some of these listed clinicians had good excuses and sent their regrets, but I suspect a number had a date with a bass or a blond. That didn't prevent their enjoying their home town publicity, however. Patients read that Doctor E. Keglake Barrel (the name is fictitious) of our city has been called upon as a national dental authority to present his scientific researches before the American Dental Association. That he was, in fact, casting his lure before the bass or singing with the boys in the back room, they did not know. A black list

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In your ORAL HYGIENE this month

"My daughter will never be a dental hygienist!"

If anyone *needs* proof that ORAL HYGIENE isn't afraid to let authors speak up, they'll find proof in "My Daughter Will Never Be a Dental Hygienist," which Evelyn Folkers, D. H., wrote for this month's issue. Certain dentists and dental colleges come in for candid criticism. Not only was Mrs. Folkers permitted to tell her courageous story, but the editorial this month supports her stand.

"Many dentists will unquestionably share the sense of shame I feel," wrote the editor.

BANKERS HELPING DENTISTS

In California at least, some of the bankers are helping dentists—helping them with their ancient problem, collections. Maybe your own banker can be interested.

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Dr. William G. Johnston, chairman of the Arizona State Dental Society's legislative committee, tells in two swift pages how his state is coping with the advertising-dentist problem.

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Two pages (including two photographs) presenting the interesting facts about Ann Arbor's fine new dental building where dentists may take postgraduate and graduate courses at fees not prohibitive for the average practitioner. *That's* news!

NEW "ANNEX" FOR "ASK O.H."

Now the magazine's famous "Ask ORAL HYGIENE" department has an annex. Starting this month, Dr. W. Earle Craig presents "Technique of the Month," well-known, tested techniques in the form of pictorial memos.—refresher courses in picture-writing. This month, Fournet-Tuller.

DETOUR DENTISTRY

—reading Dr. S. A. Allen's two pages about Dr. Edgar Buchanan of Pasadena who is a part-time movie star. Maybe you saw him in "Sea Hawk" or "Arizona," and didn't know you were looking at another dentist.

In your October ORAL HYGIENE

of clinicians A. W. O. L. might be desirable.

To continue the fault-finding on the subject of clinicians, many dentists are annoyed by the inanity of the material offered in some instances. Just because one man twists cotton around a toothpick a certain way to sweep the interproximal spaces is no reason for calling this a piece of research. The fellow who gets a little less shiver to the spatula in mixing plaster or an erotic roll to the bowl hardly deserves the title of clinician.

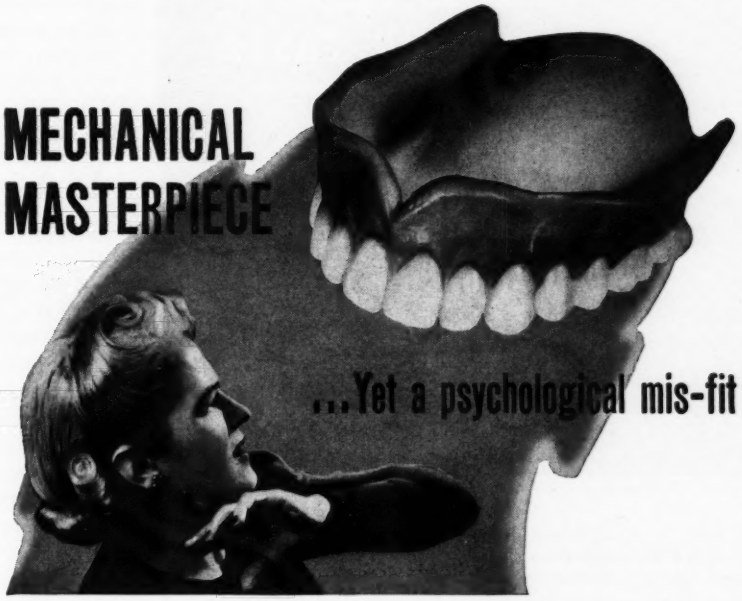
I am also depressed by gadgeteers who take the hardest possible way with the most tools to do the simplest things. If a job can be done with a jackknife there is little reason to have an armamentarium that resembles the table equipment for a twelve course dinner.

Movie of the Month . . .

Now and then there arises someone who views the dental scene with a bit of the humor that it deserves. John C. Metcalf of Alhambra, California, in describing the average dentist's operating bracket calls it the surrealist's weirdest dream. Mr. Salvador Dali, with his arms protruding out of melting watch cases, his phantasmagoria of cogs and liquid faces, would find a delectable subject for his extenuated art if he could see a dentist's operating bracket. When they throw together blood-soaked cotton rolls, instruments of every conceivable angle, a pair of spectacles and a denture or two belonging to the patient, to say nothing of the dentist's cuff links—there, then, is an operating bracket to behold.

John Metcalf has done something about it: He has made a motion picture showing the perplexed dentist before and after he took a study club course in operative procedures. The rubber dam scene is one of the best. With the gestures and help of the patient a dentist puts a rubber dam in place. There are enough ligatures running off in all directions to resemble a telephone switchboard. The choice bit in Metcalf's picture is the scene wherein the patient swallows the inlay. Time passes and so does the inlay. The patient returns with the inlay neatly wrapped in a piece of tissue. The cementation ceremony following the long excursion through the alimentary canal must be seen to be appreciated. If you see Metcalf's

MECHANICAL MASTERPIECE



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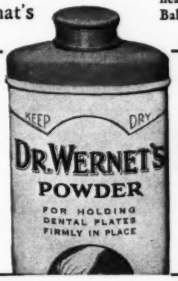

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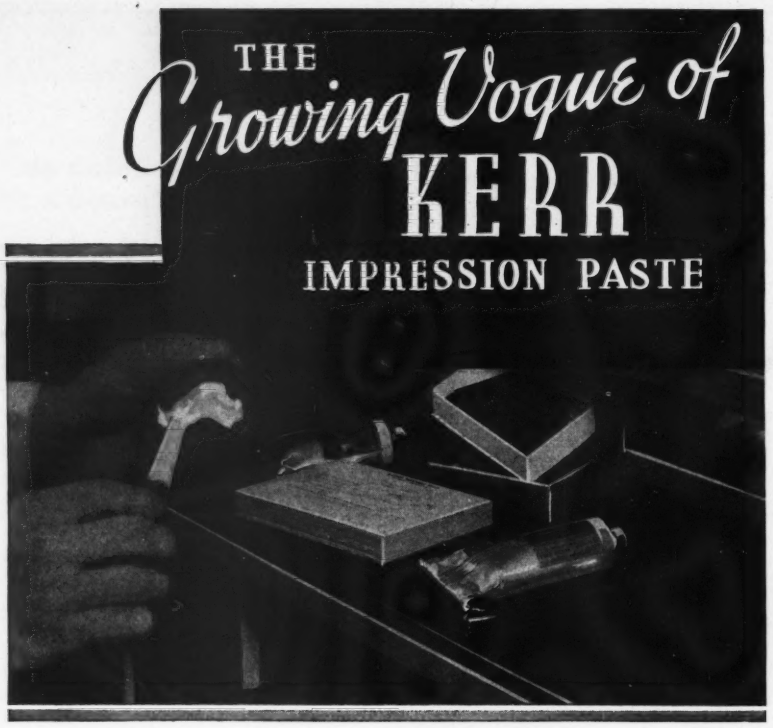

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS, OF AUGUST 24, 1912.

Of The Dental Digest, published monthly at Pittsburgh, Pa., for October 1, 1940.

State of Pennsylvania,
County of Allegheny,
ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared M. B. Massol, who, having been duly sworn according to law, deposes and says that he is the Publisher of The Dental Digest, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 411, Postal Laws and Regulations, printed on the reverse side of this form to wit:

1. That the names and addresses of the publisher, editor, publication manager, and business managers are: Editor, E. J. Ryan, B.S., D.D.S., 708 Church Street, Evanston, Ill., Publisher, M. B. Massol, 1005 Liberty Ave., Pittsburgh, Pa. Publication Manager, R. C. Ketterer, 1005 Liberty Ave., Pittsburgh, Pa.

2. That the owners are: Dental Digest, Inc., 1005 Liberty Ave., Pittsburgh, Pa.; Oral Hygiene, Inc., 1005 Liberty Ave., Pittsburgh, Pa.; M. B. Massol, 1005 Liberty Ave., Pittsburgh, Pa.; Louise A. Smith, 10 Robin Rd., Pittsburgh, Pa.; Lynn A. Smith, 1005 Liberty Ave., Pittsburgh, Pa.

3. That the known bondholders, mortgages, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraph next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company is trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stocks, bonds, or other securities than as so stated by him.

(Signed) M. B. MASSOL,
Publisher.

Sworn to and subscribed before me this 17th day of September, 1940.

(Seal) E. G. Burgdorf, Notary Public.
(My commission expires May 16, 1944.)

picture billed any place in your community, put it down on your Must List.

Wages and Hours Vs. Service . . .

The wife of a dentist rose to sing at a dinner held by one of the special groups at the Cleveland meeting. The union musicians played a couple of accompaniments for her and forthwith submitted a bill for $25.00. This is the kind of racketeering that hurts the cause of trade unionism. By way of contrast, at a meeting of the American Association of Public Health Dentists, likewise held in Cleveland, the talk was entirely concerned with what could be done to help the people. No one here talked of hours of labor or the wages therefrom. State borders were dissolved and the totality of the United States was expressed. Whatever one dentist in a given community learned about public health, he was glad to pass on to dentists in other communities. There were no trade secrets, no secret deals, no selfish motives.

Under the present leadership of Leon Kramer of the Kansas State Health Department and Frank Cady of the United States Public Health Service, this group has grown from a small beginning a few years ago to a powerful source for the dissemination of dental public health information. Already more than half the members of this association have taken graduate work in leading American universities to qualify as public health administrators.—E. J. R.

★

If you are interested in reprints of the RYAN EXAMINATION, TREATMENT, AND EDUCATION RECORD FOR DECIDUOUS TEETH, (*see August issue, page* 279) direct your requests to

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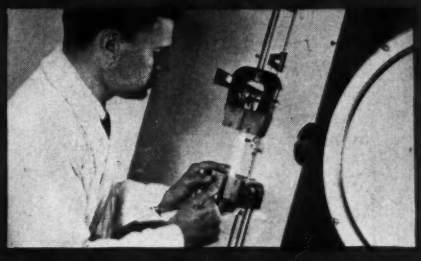

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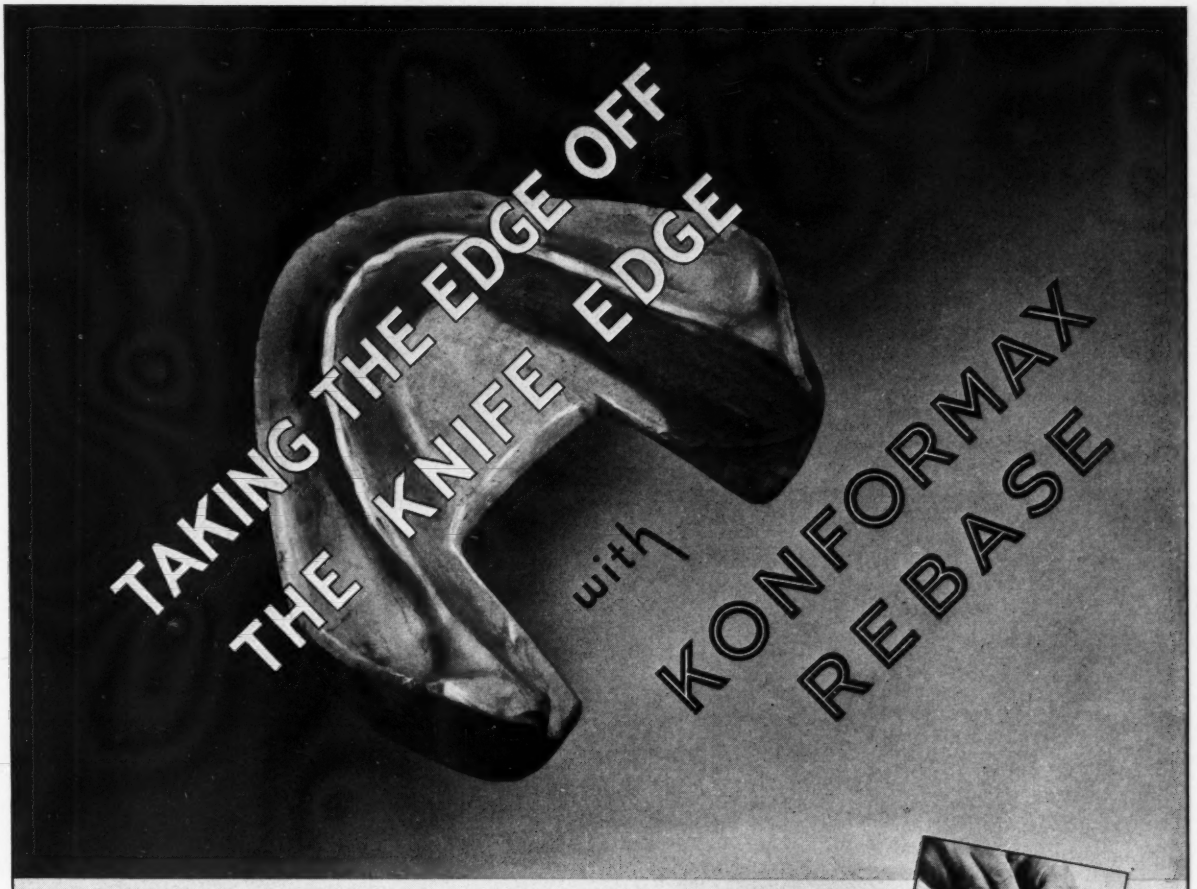

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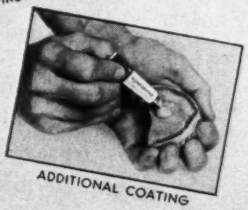
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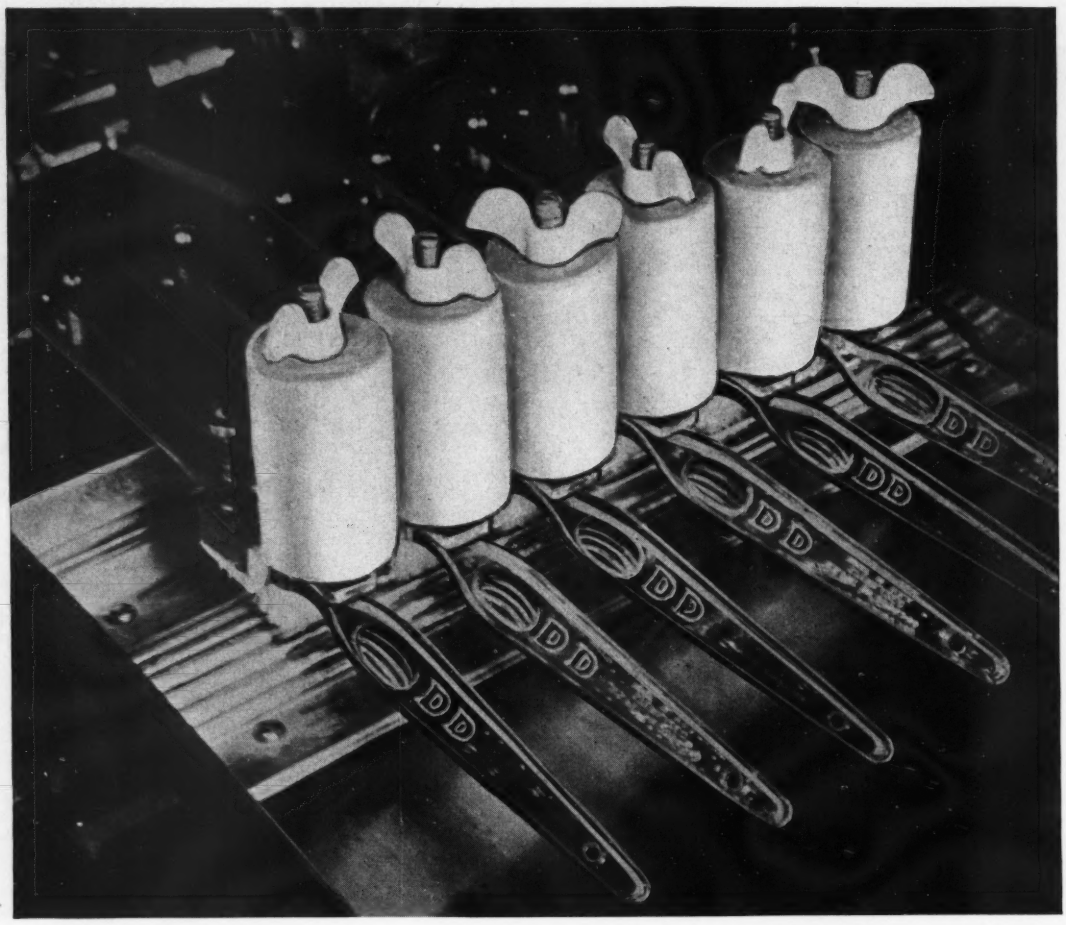

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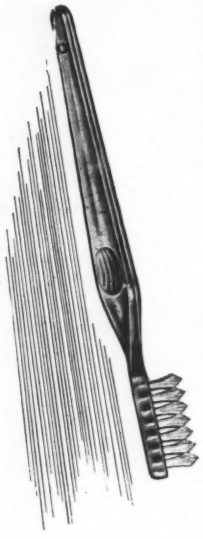

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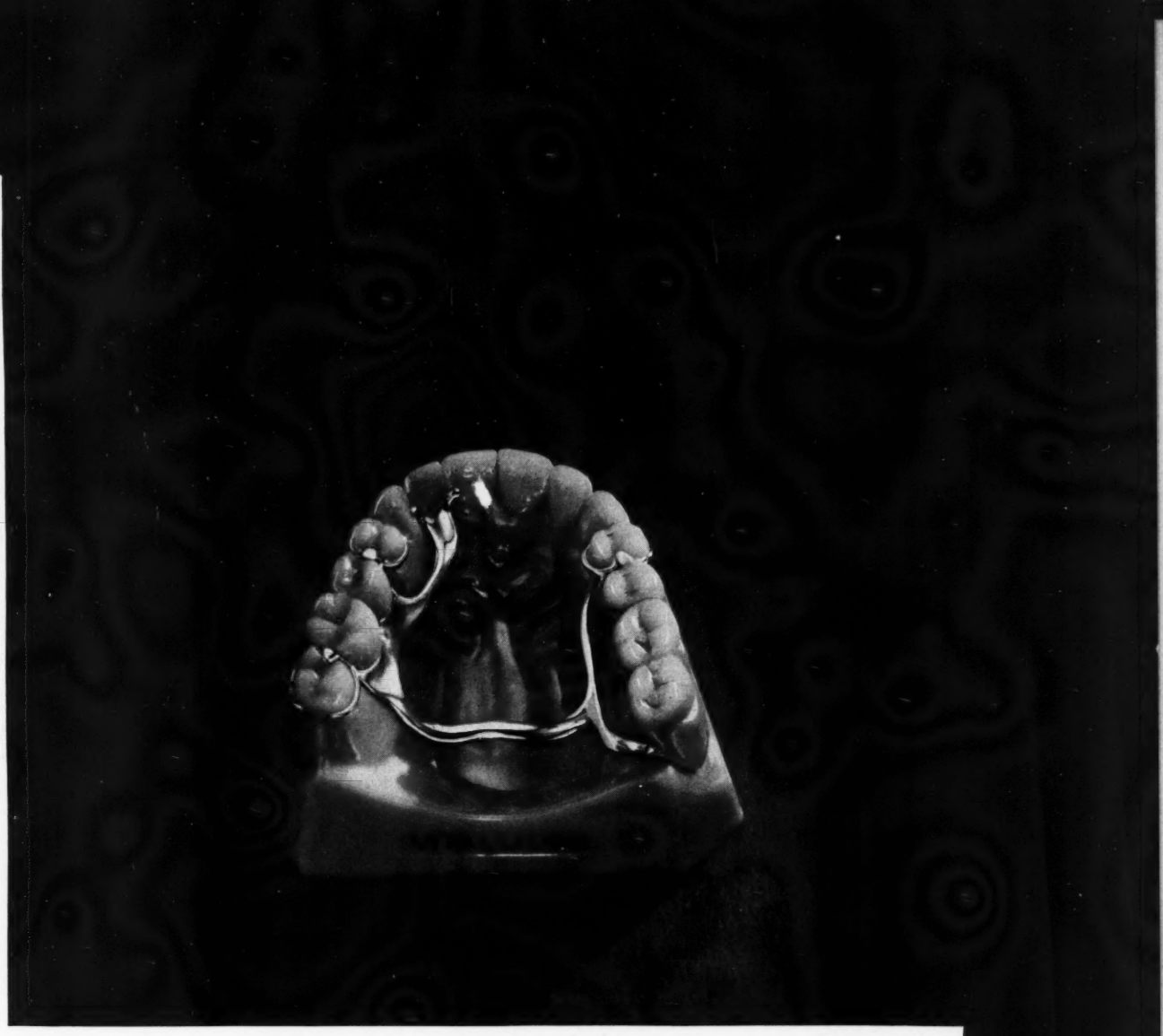

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